

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Improvements relating to the Production of Cathode Ray Tubes

We, SYLVANIA-THORN COLOUR TELEVISION LABORATORIES LIMITED, a British Company, of 105-109 Judd Street London, W.C.1., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to the production of cathode ray tubes and provides an improved method of applying luminescent materials to face plates for such tubes. The method is of outstanding interest in the production of colour television tubes.

According to the present invention, a method of producing a luminescent screen for a cathode ray tube comprises preparing a transfer including a sheet of flexible material, a layer of electron-permeable, light reflective material and a layer containing luminescent material, applying the transfer to a face plate for a cathode ray tube with the help of a tacky adhesive, removing the flexible sheet while leaving the luminescent material and the light-reflective material in position on the face plate and baking the face plate to remove volatiles. By a "tacky" adhesive is meant in this specification one which, substantially immediately upon the application of the transfer to the face plate, will form a bond between the face plate and the materials to be transferred which is stronger than the bond between those materials and the flexible film.

The layer containing luminescent material may cover the whole area of the transfer in the case of a monochrome tube or may take the form of discrete areas, such as a pattern of stripes, in the case of colour television tube.

The preferred method for the application of the transfer to the face plate is by the technique of vacuum forming and for this

[Price 4s. 6d.]

purpose the flexible film is preferably both flexible and extensible and is advantageously composed of an organic, polymeric film-forming substance. Films of linear polyester resins have been found very useful in this connection.

The preferred application of the method according to the invention is in the production of colour television tubes, in which the transfer prepared is a sandwich including a sheet of flexible material, a plurality of spaced lines of beam indexing material (as known in the art), an electron-permeable metallic layer, and a plurality of correspondingly spaced lines of phosphors of differing colour emission. The application of the transfer to the face plate follows as in the method set forth above. Transfers can be prepared separately for each individual face plate, for example by printing on a stretched sheet. Alternatively, rolls of sheet material can be printed and selected areas cut for application to individual face plates. The latter method leads to considerable economies, and makes it possible to carry on the greater part of the production of the colour television tubes alongside that of black and white tubes on conventional machinery.

One process embodying the invention will be described by way of example, making reference to the drawing accompanying the provisional specification in which:

Fig. 1 is a diagrammatic cross-section of a transfer as prepared during the course of the process and

Fig. 2 is a diagrammatic cross-section of a face plate and transfer sandwich during the step of applying the sandwich to the face plate.

A polyester film 11, 0.00025 inches in thickness, is attached to a vacuum forming frame by means of adhesive. The frame is

heated around the edge, causing the film to shrink and tauten until it is tightly stretched over the frame, thus forming a flat surface enabling photographic contact prints to be made on it with a consequently good, clear line structure.

A colour screen transfer sandwich 10, as shown in Fig. 1, is then built up by the application of the following to a surface of the film 11.

a) A photoresist coat 12, exposed, washed and dried.

b) A coat 13 of 0.2% nitrocellulose in butyl and amyl acetates, dried after application.

c) A pattern of lines 14 of a beam index phosphor, located and printed by the photoresist technique as known in the art.

d) A coat 15 of aluminium, vaporised on to the index lines.

e) A further coat 16 of 0.2% nitrocellulose in butyl and amyl acetates.

f) A pattern of lines 17 of three colour phosphors, designated R, G and B, located and printed by the photoresist technique.

The photoresist coat 12 serves as a release coating and also provides a slightly irregular surface which ensures that the aluminium coat 15 is deposited in such a form that it can without damage to itself permit the passage of volatiles on baking.

A glass face plate 18 is cleaned and a tacky adhesive is applied to its concave face. The vacuum forming frame 20 carrying the prepared transfer sandwich 10 is then placed in position within the face plate, as shown in Fig. 2. The frame is provided with a rubber gasket 21, and air ducts 22 within the wall of the frame lead by way of a pipe 23 to a vacuum pump (not shown).

The space below the sandwich 10 is then evacuated and the film together with the colour screen is drawn down onto the concave surface of the face plate 18, where it is held by the adhesive. The sandwich is then further pressed down to improve its adhesion to the plate by smoothing the upper surface of the film 11 with a soft cloth. The film is then cut from the frame 20 and the frame removed.

The film 11 is then stripped from the face plate, leaving the colour screen comprising the coats and layers 12-17 intact and firmly attached to the concave surface of the plate. The plate is then baked for 60 minutes at 450°C to remove all volatile material.

WHAT WE CLAIM IS:—

1. A method of producing a luminescent screen for a cathode ray tube which comprises preparing a transfer including a sheet of flexible material, a layer of electron-permeable, light-reflective material and a layer containing luminescent material, applying the transfer to a face plate for a cathode ray or like tube with the help of a tacky adhesive, removing the flexible sheet while leaving the luminescent material and the light-reflective material in position on the face plate and baking the face plate to remove volatiles.

2. A method according to claim 1 in which the transfer is applied to the face plate by vacuum forming.

3. A method according to claim 1 or 2 in which the flexible film is composed of an organic, polymeric film-forming substance.

4. A method according to claim 3 in which the film is of a linear polyester.

5. A method according to any of claims 1 to 4 for the production of colour television tubes, in which the transfer includes the sheet of flexible material, a plurality of spaced lines of beam indexing material, an electron-permeable metallic layer, and a plurality of lines of phosphors of differing colour emission spaced in accordance with the spacing of the index lines.

6. A method according to claim 5 in which the transfer is prepared by printing rolls of the sheet material and selected areas are cut for application to individual face plates.

7. A method of producing a luminescent screen substantially as described with reference to the drawing accompanying the provisional Specification.

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1 SHEET

PROVISIONAL SPECIFICATION

This drawing is a reproduction of
the Original on a reduced scale.

Fig. 1.

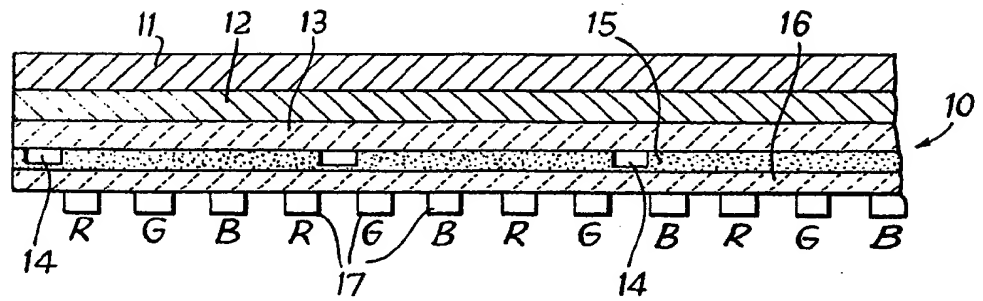


Fig. 2.

